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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE • JANUARY 23, 1943

Fire Under Snow

See Page 62

A SCIENCE SERVICE PUBLICATION

Do You Know?

Brazil has replaced India as our main source of industrially useful *castor beans* and oil.

Limitation of *alcohol* in toiletries will save a million gallons a year for military production.

The United States produced more *metals* and minerals in 1942 than at any time in its history.

Soldiers of the Arctic Medical Corps carry collapsible *litters* which can be clamped to skis, to drag the wounded over the snow.

A method of reducing *liver* to a brown powder, worked out by U. S. Department of Agriculture chemists, conserves shipping space.

For ordinary dried or evaporated fruit, the water content is reduced from about 80% to 25%, but in *dehydrated* food it is reduced to 7% or less.

Cocoanut oil, now scarce, produces quick-lathering soap because it contains a large proportion of lauric and myristic acids, which chemists call "short-chain carbon acids."

Our national *diet* was better in 1941 and 1942 than in the previous five years, due to higher income levels, enriched flour, and government distribution of food in schools.

Cultivated *guayule* may yield twice as much rubber as the wild plant.

The *optic nerve,* which connects the human eye with the brain like a telephone cable, contains about 800 bundles of nerve fibers.

Tanganyika, in British East Africa, is the world's greatest source of sisal.

Stratosphere masks worn by pilots of Kelly Field are lined with wool-like *asbestos* to protect wearers from both cold and fire.

Question Box

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Most articles which appear in* SCIENCE NEWS LETTER *are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.

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ASTRONOMY

Moon To Blot Out Sun

Total eclipse will streak across Japan, Pacific and Alaska on February 4, ending the day before it begins. War will prevent scientific observation.

➤ THE MOON will blot out the sun on Thursday, Feb. 4, along what might be a bomber's route between Alaska and Japan. But it is a safe bet that this will be the one total solar eclipse of the century that no very serious astronomical expedition will be observing.

For one thing, most of the choice points in the band of temporary total darkness are at sea where there is no stable base for telescopes. The main difficulty is that there is a war on, and men are too busy blotting each other out to bother about the interference of the moon with the sun's light.

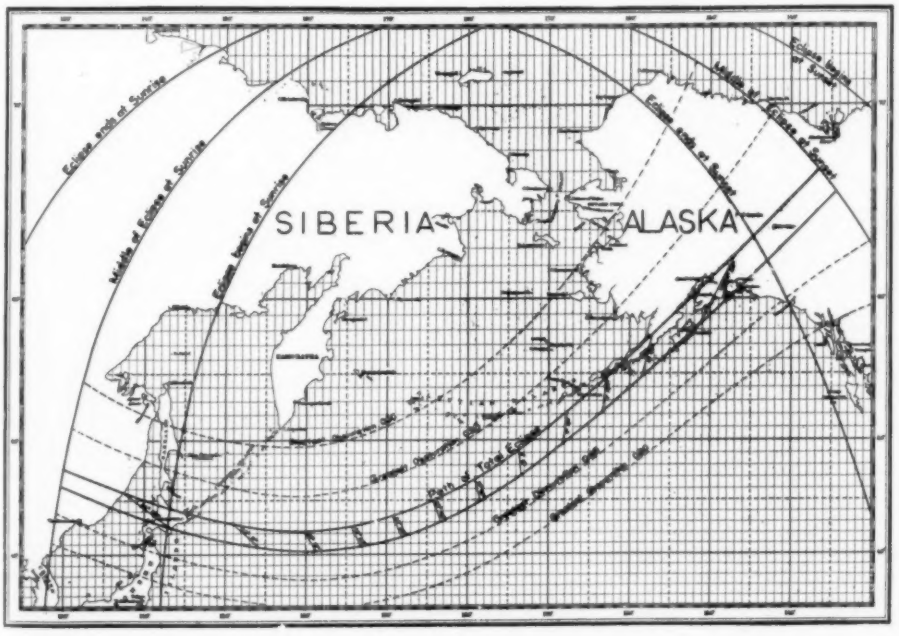
Astronomers in normal times might be tempted to take a run up to Anchorage, Alaska, where the totality lasts 48 seconds shortly before sunset that day. They might be interested in rechecking upon the Einstein gravitational effect that bends starlight passing by the sun. Or they might photograph the corona, the sun's halo. Just now many astronomers are busy with ballistics, navigation, making military telescopic cameras or other such important war jobs.

Soldiers, sailors and airmen will pause a few minutes in their fighting and work to see the glory of a total eclipse, the clouds and fog of the Alaskan winter permitting.

The moon's shadow will touch earth in Manchuria at sunrise on Feb. 5. The eclipse will end a day before it begins, by the calendar, because it crosses the international date line in its sweep across the Pacific. After crossing the Sea of Japan, passing across the Japanese island of Hokkaido, it travels swiftly across the ocean. After running south of the Andreanoff Islands, the shadow will go just south of Dutch Harbor, darken part of Kodiak Island and cross Alaska on its way to leave the earth in the northern part of the Canadian Yukon at sunset.

It is unfortunate that the Japs are so "civilized" that they will see no symbolism in an eclipse obscuring the rising sun.

The sun will be seen partially eclipsed throughout Alaska, along the west coast regions of Canada and the United States.



TOTAL ECLIPSE—This map shows the pathway through which the total eclipse will be visible on February 4, as prepared by the U. S. Naval Observatory for the Hydrographic Office.

As the Chaldean astronomers first discovered, eclipses recur at intervals of 6,585 1/3 days, known as a saros. This figures back to Jan. 24, 1925, when a total sun's eclipse was seen by astronomers and public alike under good conditions in New York, southern New England, as well as farther west.

As consolation for missing the Feb. 4 eclipse, astronomers will have to look forward to the next eclipse to come within possible reach. On July 9, 1945, there will be a total solar eclipse beginning near Boise, Idaho, traveling northeastward through Montana, Saskatchewan, Manitoba, across Hudson's Bay to Greenland and on into Europe and Asia. Perhaps astronomers can conduct Victory expeditions to observe this astronomical event, transported by bombers that will be through with carrying out other missions.

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VETERINARY MEDICINE

New Vaccine Developed To Protect from Distemper

➤ DOG OWNERS can now have their pets protected against distemper by a new vaccine, adding another form of treatment to the immunization methods used against this widespread disease. The vaccine is prepared by passing live distemper virus through 50 to 60 ferrets by a method developed by Dr. R. G. Green, University of Minnesota bacteriologist. This deprives the virus of its disease-causing power. But a single injection is claimed to give a dog lifetime protection against distemper.

Often called the "scourge of dogdom," this flu-like disease is highly contagious, often fatal, and occurs in every section of the country in all seasons. Because it is so difficult to treat, veterinarians recommend immunization of puppies as the best protection.

Animals eight to ten weeks old can be given early immunity by only one injection of the new vaccine, compared to three or four injections required in previous methods of distemper control, according to Dr. Charles E. Fanslau, director of the veterinary division of Winthrop Chemical Company, distributors of the product for Fromm Laboratories.

Two other methods of immunizing dogs have been used successfully in recent years.

In one method, vaccine injections are followed by injections of living virus. Dogs, instead of ferrets, are used to produce the vaccine in this procedure, and

manufacturers are finding it difficult under present conditions to obtain enough animals.

The other method combines the administration of anti-canine-distemper serum with living virus. Whichever method is used, authorities warn that immunization must be undertaken only by a veterinarian.

Science News Letter, January 23, 1943

MEDICINE

New Hope for Polio

Mouse-adapted polio virus counteracts infantile paralysis-causing parent substance in monkeys. Research may reveal practical application.

➤ HOPE that a chemical inhibitor for treating infantile paralysis may some day be developed is offered by an editorial in the *Journal of the American Medical Association* (Jan. 16).

This possibility is suggested from research by Drs. C. W. Jungeblut and Murray Sanders, Columbia University bacteriologists. They passed the New Haven strain of polio virus through cotton rats, thus adapting it to white mice. By this time the virus had lost most of its original disease-producing potency in monkeys.

Among their observations was evidence that a strong antagonism existed between the mouse-adapted virus and the parent strain which caused paralysis in monkeys.

When they mixed a few drops of the mouse-adapted virus with the deadly form, it was found that monkeys survived at least a hundred minimum doses of virus that ordinarily would have caused paralysis.

Another series of experiments by the researchers showed that this living vaccine from mice also had value in protecting the monkeys from contracting polio or in reducing the paralytic symptoms. From three to five doses of the mouse-adapted virus were given by injection at daily intervals from one day to two weeks before inoculating the monkeys with simian infantile paralysis. Symptoms were greatly reduced and only 13 out of 26 monkeys developed recognizable paralysis. All 19 monkeys that did not get the treatment developed partial or complete paralysis.

The main problem now, the medical journal comments, is to develop a basic explanation of the observed antagonism between the mouse-adapted virus and its parent. Some believe the action is due to a noninfectious chemical inhibitor formed by the mouse-adapted virus.

Research work by Dr. Jungeblut, Dr. Sanders and associates is continuing. For, as the journal points out, such a basic discovery would perhaps be of major practical interest.

Science News Letter, January 23, 1943

CHEMISTRY

Structure Governs Use

Difference between springy rubber and hard plastic or tough fiber depends upon the way the molecules regiment themselves.

➤ THE DIFFERENCE between a springy rubber-like substance and a hard plastic or a tough fiber, either synthetic or natural, lies in the tendency for the molecules of these substances either to contract or to form crystals, Dr. H. Mark, professor of organic chemistry at the Brooklyn Polytechnic Institute, is telling chapters of Sigma Xi at various universities, speaking as a national lecturer for Sigma Xi.

The more crystallization in its structure the more the substance becomes a typical fiber, such as nylon, silk, cotton or rayon, Dr. Mark explained. If the mutual attraction between the chain-like molecules of a given material is low, then it will show mainly the properties of an elastomer such as rubber, Buna S., Neoprene, Hycar, butyl rubber, etc. This is also true if the molecules do not fit well into a regular three-dimensional lattice structure. In between these extremes, the substance will show the properties of a plastic, such as hard rubber, methacrylate (lucite), vinylite, polystyrene or ethyl cellulose.

Present experimental knowledge shows that all of these substances have about the same fundamental structure, but it is their ability to crystallize that gives them different properties.

Dr. Mark told his scientific audience that all types of what the chemist calls "high polymers," whether they be rubbers, plastics or fibers, have the same high order of polymerization, that is, their molecules are composed of about 2,000 or more atoms.

"Polymerization" is the name that the chemist gives to the process of making big molecules out of little ones. Either by natural processes or by the skill of the chemist's reactions, simpler materials are built up into more complex ones to form our most useful rubbers, plastics and fibers. These are molecules in which the atoms are visualized as being in a long chain.

"During the past 15 years," Dr. Mark said, "a new branch of organic chemistry has been started and gradually developed. This is the chemistry of the high polymers. The natural products belonging to this class of substances, for example, cellulose, starch, proteins, chitin, rubber, etc., have been known for a long time, but it was only recently that successful attempts were made to elucidate their molecular structure and to realize their common fundamental building principle. Synthetic products of resinous character built up from small molecules, such as formaldehyde, ethylene oxide, vinylchloride and styrene, have also been known for some time, but again their molecular structure and their fundamental relationship with the natural high polymers were not known until about 10 or 15 years ago."

Dr. Mark named the dozen investigators who had contributed most to the knowledge of the structure of these substances: Dr. W. T. Astbury, Leeds, England; the late Dr. W. H. Carothers, du Pont chemist whose work led to nylon and Neoprene; Dr. K. Freudenberg, Heidelberg, Germany; Dr. W. N. Haworth, Birmingham, England; Dr. H. Hibbert, Montreal, Canada; Dr. J. W. Hill, du Pont; Dr. P. Karrer, Zurich, Switzerland; Dr. E. O. Kraemer, Newark, Del.; Dr. C. S. Marvel, Urbana, Ill.; Dr. K. H. Meyer, Geneva, Switzerland; Dr. H. Staudinger, Freiburg, Germany; Dr. G. S. Whitby, Akron, Ohio.

Science News Letter, January 23, 1943

MEDICINE

Brief Malaria Treatment

Effective method advocated by naval officer with 20 years experience in anti-malarial work in southeast Asia would save quinine and time.

➤ MALARIA-STRICKEN soldiers can be treated just as effectively by giving less quinine over a shorter period of time than in the standard method. This plan is advocated by Dr. Aubrey H. Hamilton, lieutenant commander, U. S. N. R., who has had 20 years experience in anti-malarial work in the war zone of southeast Asia.

Huge savings of war-scarce quinine and valuable time of hurried physicians is foreseen in a report just issued in collaboration with the Board of Economic Warfare and Department of Commerce.

Only about a third as much quinine would be required to complete treatment of a hundred typical cases as compared to the standard treatment. This amounts to a saving of over 50,000 grains. Treatments would require 4,859 fewer days.

The hydrochloride form of quinine was most used by Dr. Hamilton and his associates. It does not upset the soldier's stomach as readily as other forms. The tablets also are not likely to harden into pellets that remain unabsorbed by the body, as occurs with quinine sulfate in tropical climates.

Quinine hooked onto hydrogen and chlorine atoms can also be taken either by mouth or injection.

"Experience in the Philippines and in Santo Domingo tends to indicate that the danger of using the intravenous route for administering quinine has been overstated in standard textbooks," Dr. Hamilton declares.

Although preferring quinine, Dr. Hamilton also evaluates the use of other anti-malarials. For cinchona bark from which we get quinine cannot supply all the anti-malarial units needed during the war. Cinchona, or "Jesuit's Bark," obtained from South America does not contain as much quinine as that from Jap-held territory. But other components from this bark with anti-malarial action can be inexpensively and efficiently extracted to augment our supply of anti-malarials.

This product, called totaquine, "is a reliable and well-tried antiplasmodial agent capable of replacing quinine in almost all instances," Dr. Hamilton maintains. It is about half as potent as quinine, requiring doses of 30 grains a day.

Quinacrine hydrochloride (atabrine), the synthetic anti-malarial, is an effective treatment but more dangerous than quinine. Its undesirable reactions are somewhat unpredictable, Dr. Hamilton warns. The American product is not more toxic than German-made atabrine, however, as was suggested by reports from South America where both had been used.

Clinical material upon which Dr. Hamilton bases his report amounts to about 750,000 malaria cases. Observations were made by several hundred physicians in the hospitals of Netherland Indies. He has now been called back to active duty where his professional knowledge and experience will be of help to American fighters.

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***LUNCH BOX**—Visitors to the Cleveland Health Museum learn from this exhibit what should go into the daily lunch box of America's industrial army to keep up health and morale.*

PUBLIC HEALTH

Decline in TB Death Rate Almost Halted in Cities

➤ THE DECLINE in the tuberculosis death rate in 42 of the largest American cities was almost halted during the last year before America entered the war, the National Tuberculosis Association announces.

In that same year, 1941, figures only now available show that the tuberculosis death rate for the entire country was 3.3% lower than in 1940, but that in the cities it was only 0.3% less than in 1940.

The tuberculosis death rate decreased during 1941 in 19 cities, increased in 17 and remained the same in six. The association points out that wartime migration and industrial activities had by no means reached their present level at the time these deaths occurred.

The most significant increases occurred in Providence, R. I.; Seattle, Wash.; Columbus, O.; Atlanta, Ga.; and Buffalo.

San Antonio continued to have the highest rate among the cities, 150 per 100,000 population. The next three highest rates occurred in Atlanta, 105; Memphis, 93; Baltimore, 90. The Mexican population in San Antonio and the Negro population in the other three cities are among the reasons for the high rates, says the association.

Akron had the lowest rate, 25 per 100,000 population. The next lowest rates occurred in Minneapolis, with a rate of 26, and Omaha, with a rate of 29.

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PUBLIC HEALTH

TNT Danger Reduced

Munitions plant workers now face less hazard than workers in 1917-1918, physicians are told. Shock is main symptom.

➤ AMERICAN munitions plant workers are in less danger of TNT poisoning than munitions workers of 1917-1918, it appears from the report of Dr. Lemuel C. McGee, medical director of the Hercules Powder Company, presented to the Congress of Industrial Health sponsored by the American Medical Association, in Chicago.

"There is reason to believe," he stated, "that recent refinements in methods of manufacture of TNT in America yield a purer product and afford less exposure to the operators than did the methods in vogue in World War I."

One protective device against TNT poisoning, he said, is to begin the shift on a full stomach.

Increased appetite and stomach distress simulating hunger are among the effects of TNT poisoning. Yellowing skin and skin inflammation are others. Most serious is liver damage, which may lead to death. Early diagnosis and removing the affected worker from contact with the chemical are essential for reducing mortality from TNT liver damage.

Nitrous fume poisoning, suspected of having caused the deaths of many victims of the Boston night club fire, is a potential hazard in munitions plants in war times.

Under normal conditions proper ventilation protects workers from these fumes, but the demands of war-time production "invite lapses in proper control of the fumes," Dr. McGee warned.

The chief offender in the nitrous fumes is nitrogen dioxide, existing in equilibrium with its polymer, nitrogen tetraoxide.

Shock is the predominating symptom in one type of nitrous fume poisoning. The victims show signs of suffocation, collapse of the blood circulation; turn blue, and death comes rapidly. The treachery of nitrous dioxide, Dr. Mcgee warned, lies in the apparent mildness of the damage to the exposed men.

In the beginning the fumes have a slightly pain-killing, sleep-inducing effect which probably stops the cough reflex that would warn the worker of his danger. Usually the worker feels too well immediately after accidental contact with nitrous fumes to seek or be willing to have medical attention. Recently, Dr. McGee related, an experienced chemist, the supervisor of a nitric acid plant who knew well the effects of contact with nitrogen dioxide, was greatly chagrined to find himself in the hospital under treatment for lung edema from having himself become exposed to the danger without realizing it.

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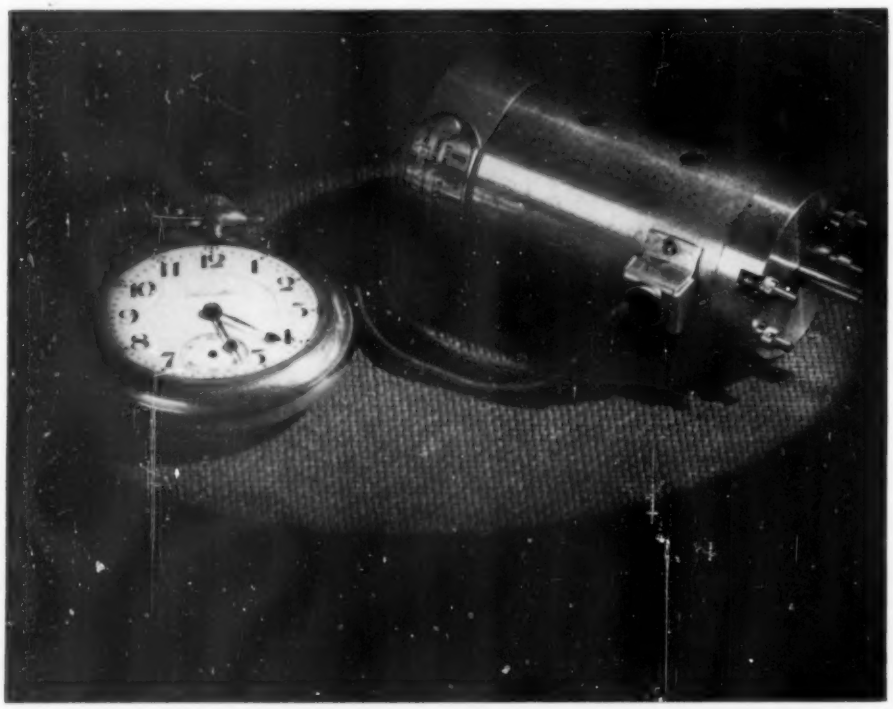

MOTOR FOR AIRCRAFT—Only a little larger than a watch is this new fractional horsepower motor for airplane control and protective devices. It weighs only eight ounces, is 3 9/16 inches long and 1⅜ inches in diameter: the rotor of the motor is a little smaller than a five-cent piece. It was designed by General Electric.

HORTICULTURE

Save Wood Ashes For Garden Fertilizer

➤ VICTORY gardens next spring can benefit from the wood fire that is crackling in your living room now. Save all wood ashes, keep them in a dry place until spring, and rake them into the soil when you are getting your seed bed ready, is the advice of H. G. M. Jacobson, Connecticut Experiment Station agronomist.

Wood ashes are a good source of potash and lime, and they also contain some phosphate. They are not a complete fertilizer, however, because they are lacking in the essential nitrogen. If this is needed (and it usually is) it must be obtained from some other source. Well-rotted manure is best, if available.

Ashes of paper burned in the incinerator are not safe to use, Mr. Jacobson cautions. Although paper is made from wood, it is apt to contain acids and other substances added in the manufacturing process, and these may not be good for plants. Coal ashes, of course, are of no value as fertilizer and should never be used.

Even wood ashes should be used with judgment; there can easily be too much of a good thing with fertilizers. Excess of potash causes plants to have pale, undernourished-looking tops. This difficulty is more apt to arise in alkaline than in acid soils.

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MEDICINE

Rotary Diet System

Persons allergic to certain foods found able to take them at regular intervals and in regular amounts. Will help those on starvation diets.

➤ A ROTARY or cyclic diet system for allergy patients, which enables them to eat a large variety of foods that otherwise might give trouble, was announced by Dr. Herbert J. Rinkel, of Kansas City, Mo., at the Fifth Annual Forum on Allergy in Cleveland.

The clue which led Dr. Rinkel to this diet system and to a new concept of how to handle allergic patients was furnished by a boy with a masked allergy to eggs. He had been eating them every day without trouble, his mother reported, and as a test he ate six eggs for lunch, without any allergic disturbance.

Dr. Rinkel was still suspicious of eggs, however, so he put the boy on a diet which excluded eggs and other foods he had been eating regularly. Five days later the boy broke his diet by taking one bite of angel food cake at a birthday party, thinking so small an amount would not matter. Within 15 minutes he had a violent sneezing spell, collapsed, and was so sick the birthday party guests had to be sent home. But for nine years since then he has been eating eggs on a regular schedule every fifth day without any trouble at all.

This boy, and many other allergic patients, have or can develop, Dr. Rinkel believes, a threshold tolerance for many culprit foods. They can eat the same amount of the food at the same meal once every other or every third or fourth day without trouble. Varying the amount of the food, the time when it is eaten, or the interval between eating it, however, upsets the tolerance and they get hives, headache, asthma, or whatever allergic symptom troubles them.

In some of them a sudden drop in temperature or the start of the pollen season also disturbs their threshold tolerance. By very careful diet and other studies, Dr. Rinkel is able to work out a diet cycle for them that avoids such trouble.

Allergists at the meeting believe the rotary diet and other features of Dr. Rinkel's studies will help patients whose allergy has not responded to other treatment and also those who are on almost starvation diets as a result of having to eliminate one food after another from their diet.

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PUBLIC HEALTH

Eye Injury Frequent

One common cause of lost time among shipyard workers is flash burn or foreign body in their eyes. Lead poisoning also serious.

➤ FLASH BURNS of the eyes and cinders or other foreign bodies getting in the eyes are among the most serious and frequent causes of lost time among workers in shipyards, Dr. Philip Drinker, of Harvard School of Public Health, reported to the Congress on Industrial Health sponsored by the American Medical Association in Chicago. The report was based on findings of a survey he and Dr. John M. Roche, serving as consultants on safety and health for the U. S. Navy and U. S. Maritime Commission, made of selected shipyards with government contracts in all parts of the country.

These eye injuries are obviously preventable, Dr. Drinker said, but he pointed out that ships are now being built in yards which cover very large areas with welding going on everywhere in them. It is very difficult to prevent flash burns of the welder's neighbors, he explained. The danger extends even to the experienced welder who lifts his shield momentarily and happens to be near another man welding.

A serious risk of lead poisoning also exists in the shipyards because of modern high speed construction schedules. It is common shipbuilding practice to paint all metal surfaces as soon as possible with red lead. Generally this is done after the metal plates are in final position, but to keep fast construction schedules, some pieces are painted in the yards. Welding these painted surfaces brings the danger of lead poisoning, against which special care must be taken for workers' protection.

Special ventilation to control welding fumes is necessary for the men working on the fore and after plates and double bottoms where, because of prefabrication type of construction, the men must work in relatively small spaces.

Paint sprayers, their assistants and those working in the immediate vicinity require special protection. To make sure that the men are provided with efficient protective equipment, only such masks and respirators as have been approved by the U. S. Bureau of Mines may be used in shipyards with government contracts.

In general, Dr. Drinker found the medical and safety departments of the yards well organized and well run, although the high proportion of "green" workers complicates the safety problems. Many yards, he reported, have as few as one or two percent of experienced men who had worked in shipyards before the war.

"We have been badly hit by the shortage of doctors in some districts, especially in rural communities," Dr. Drinker declared, "but probably we are no worse off than many other industries. We doubt if our position in this respect represents any new problems."

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MEDICINE

Aero-Medical Research Wins Jeffries Award

➤ PIONEERING research in aviation medicine has won the John Jeffries Award for Dr. Edward C. Schneider, professor of biology at Wesleyan University, Middletown, Conn.

Army, Navy and civil pilots have been tested by use of the Schneider Physical Fitness Index for over 20 years. It represents Dr. Schneider's best known work.

He will be presented with the award at the Honors Night Dinner of the Institute of Aeronautical Sciences to be held on Jan. 26. This honor is given annually "for outstanding contributions to the advancement of aeronautics through medical research."

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PSYCHOLOGY

It Takes Higher Current To Cause Pain in Some

➤ THE COMPLAINT of the Charles Dickens character that, "I feel it more than other folks," may have some basis in scientific fact, after all.

Tests of 15 college women revealed that they differ greatly in sensitivity to pain and that the same individual may vary considerably from day to day.

The experiment, conducted by Dr. Lyle H. Lanier, of Vassar's department of psychology, determined the smallest electric current that would cause pain when applied to different areas of the skin on the forearms and foreheads of the girls.

The range of these smallest painful currents was from 2.25 to 65 microamperes, Dr. Lanier reports in the current issue of *Science*. And on one test the pain threshold was 300% greater than the average.

The findings in this experiment are at variance with those previously reported by other investigators who used heat as the method of producing pain.

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PHYSIOLOGY

Speck of Muscle Tells of Hidden Hunger

➤ IN THE future, when the doctor wants to know whether a patient's tired feeling, irritability and other vague symptoms of illness are due to the early stages of hidden hunger for vitamins, he may punch out with a needle a pinhead sized speck of muscle for a chemical test of its vitamin content.

Such a test, scientifically termed a micro muscle biopsy, can be used to determine whether or not a person is well nourished with respect to vitamin B_1 (thiamin), and probably also other vitamins, Dr. Mildred H. Carleen, Dr. Norman Weissman, Dr. Philip S. Owen and Dr. Joseph W. Ferrebee, of the Harvard School of Dental Medicine, report in the current issue of *Science*.

A person's state of nourishment depends not only on the food he eats but also on how his body uses the food and how much of the vitamins get into muscles and other body tissues where they are needed to help along vital processes.

A severe degree of thiamin deficiency or a complete lack of this vitamin leads to polyneuritis or beriberi which can be diagnosed from the symptoms. Mild degrees of thiamin or other vitamin lack, however, lead to illness that is difficult to diagnose because the symptoms are not so characteristic and clear-cut. It is not easy, either, to determine the vitamin requirements for good health, that is, the normal vitamin requirements.

Tests of the vitamin content of the blood and body wastes now in use are only an indirect measure of a person's nutritional status. Before they can be used critically, the Harverd scientists point out, it is necessary to know, for example, how much of a given vitamin there is in the muscles and other body tissues when the amount in the blood is at a certain level.

The micro muscle biopsy will give such information and therefore help not only in diagnosing slight degree of vitamin deficiency but in determining just how many in the population are suffering from mild degrees of hidden hunger.

Science News Letter, January 23, 1943

POPULATION

Equality in Sex Ratio Predicted for After War

➤ AFTER THE WAR the numbers of men and women in the country will be practically equal and the West will no longer be a happy hunting ground for maiden ladies seeking husbands. This prediction is suggested by a report from Metropolitan Life Insurance Company statisticians.

The peak sex ratio of 1,060 males to every 1,000 females was reached in 1910, following a decade of the "greatest voluntary movement of population the world has probably ever seen," the statisticians point out. Since then the ratio of men to women has been steadily dropping. In 1940 it was 1,007 males to every 1,000 females.

Since then (1940), there have been important changes arising from the war conditions. Many areas have suffered a loss of population to newly expanding industrial centers. All areas have undergone a withdrawal of men for military service. What the future will bring in the distribution of men and women within the country is very uncertain, for so much depends upon the needs of the Army for men and the demands of our war industries for workers.

In any event, the outlook is that our postwar society may be constituted of practically equal numbers of men and women, and without such marked variations in different parts of the country as were found in the past.

Science News Letter, January 23, 1943

IN SCIENCE

BOTANY

Colchicine Has Effect On Colchicum Cells

➤ COLCHICUM, the plant that produces colchicine, is not immune to the effects of its own drug, experiments by Dr. Ivor Cornman of the University of Michigan indicate.

Since colchicine produces the sudden evolutionary changes in plants that have made it famous in recent years by a partial checking of cell division, giving new cells two or more times the normal number of heredity-bearing chromosomes, Dr. Cornman made his tests simply on cell division in root tips of two species of Colchicum. Weak colchicine solutions had no effect, but when the strength was stepped up to 2.5, 5 and 10% the cell-division process was seen first to be hindered, then blocked altogether.

Since there is always colchicine in the tissues of Colchicum, the question naturally arises, how can cell division go on at all? Why doesn't the plant make itself extinct with its own poison? Dr. Cornman doesn't undertake to answer that one. He merely remarks that the immunity must be found somewhere else in the plant's mechanism of cell division.

Details of the research are reported in the *Botanical Gazette*.

Science News Letter, January 23, 1943

PHYSIOLOGY

Deafness Is Sometimes Due to Allergy

➤ HEARING CAN be improved or restored in some hard of hearing patients by allergic treatment, Dr. Hugh H. Kuhn, of Hammond, Ind., told the Fifth Annual Forum on Allergy at Cleveland. Not all deafened patients can be helped. In some cases, however, characterized by variation in the degree and time of hearing loss—patients, for example, who hear better on some days and worse on others—the cause may be an unsuspected allergy which causes a swelling of part of the hearing mechanism with consequent loss of some hearing.

Science News Letter, January 23, 1943

E FIELDS

NUTRITION

Cooking Peas with Soda May Be O.K. After All

➤ COOKING PEAS with soda (sodium bicarbonate) to keep their bright green color, a custom long frowned upon by nutritionists, may be o.k. after all, it appears.

Nutritionists objected to the soda on the ground that it destroyed some of the vitamin B_1 (thiamin) in the peas. Dr. Harry J. Deuel, Jr., Dr. Cornelia Johnston, Dr. Louise Schauer, and Dr. Sam Rapaport, of the University of Southern California Medical School, have tested the matter by cooking fresh peas and two kinds of frozen peas with and without soda in the cooking water. (*Science,* Jan. 8.)

The experiments show, they report, that there is no greater destruction of the thiamin remaining in the intact pea after cooking with soda than when water alone is used. There is, however, somewhat more destruction of the thiamin that is leached out of the pea during the cooking. The loss amounts to 8.3% in the frozen peas and 3.6% in the fresh peas cooked with soda.

Science News Letter, January 23, 1943

GEOLOGY

Gas Now Wasted Could Be Obtained from Coal Seams

➤ FUEL SHORTAGE in the Northeast could be alleviated by the use of natural gas found in the coal seams in the Eastern coal mining fields. The gas is now wasted, but could be saved and used through a new development on horizontal drilling, declares Leo Ranney, mining engineer and president of the Ranney Oil Mining Company.

Vertical holes have been drilled into the coal seams, but seldom produce enough gas to be of commercial use. The gas exists absorbed in the coal and not in pockets as found in connection with oil deposits. It is therefore necessary to drill along the horizontal seams. This can be done by drilling out like the spokes of a wheel from a central shaft, or drilling a series of parallel holes from a tunnel.

The holes should be from 2,000 to 5,000 feet in length and cased only for the first 400 feet. The parallel holes may be 800 feet apart. A vacuum is applied to the cased ends and the gas is drawn out of the coal.

Mr. Ranney's studies lead him to believe that there are now 500,000,000 cubic feet of gas wasted each day. He is convinced that it can be gathered and distributed and sold in competition with other gas for household use at a satisfactory profit.

Not only would the salvage of this gas be a profitable business venture, but also it would save the lives of many miners each year. The gas is the well known methane, or fire-damp, which when mixed with air is highly explosive. Approximately 275 men lost their lives in 1940 in major mine explosions in the United States. Used in the home for heating and cooking, methane is as safe as any gas.

Science News Letter, January 23, 1943

MEDICINE

Chronic Sinus Sufferers Relieved by Sulfa Drug

➤ RECOVERY FROM chronic sinus trouble can be achieved in between three and four weeks on the average by local treatment with sulfathiazole, Dr. Roland F. Marx, eye, ear, nose and throat specialist, announced as a result of studies at the University of California Medical School.

Almost three-fourths, 70%, of the patients with maxillary sinusitis were relieved, though their symptoms had persisted on the average for 10 months. The maxillary sinuses, also called the antra, are the ones in the cheek bones.

No undesirable effects either generally or locally were noted. The results were so encouraging that Dr. Marx suggests a trial of sulfathiazole treatment before resorting to surgery in such cases.

The sulfathiazole is dropped directly into the involved sinuses. Most practical method of giving it is in a lubricating base slowly soluble in water. When given in this way, traces of the sulfathiazole powder were recovered from the antrum as long as two weeks after instillation.

Failure of the treatment in less than one-third of the cases seemed due, Dr. Marx reported, to the presence of abundant chronic inflammatory tissue lining the antrum which the drug apparently did not get through.

Science News Letter, January 23, 1943

CHEMISTRY

Soybeans Used in Production Of Laminated Board

➤ SOYBEANS ARE used to produce laminated board, valuable in aircraft and other war industries, in a new method announced by Dr. George H. Brother of the Regional Soybean Industrial Products Laboratory, U. S. Department of Agriculture, in a publication of the American Chemical Society.

Sheets of unsized kraft paper or other fibrous material are soaked with a solution of soybean protein. After drying, stacks of these plastic sheets are united into laminated board by heat and pressure. This method promises to augment the nation's limited supply of high-priority phenolic resin now being used.

Low water-resistance of the resultant board created a problem. Single sheets of the more waterproof phenolic resin placed on the top and bottom of the stack of soybean sheets before pressing, was the solution.

Production of laminated board has been speeded by the new process, Dr. Brother declares, since pressing time for phenolic resin board is about five times as great as when soybean-protein-phenolic material is used.

Science News Letter, January 23, 1943

INVENTION

Change in Patent System Would Hamper Progress

➤ PUBLIC MISUNDERSTANDING of the patent monopoly and the part patents play in encouraging invention and the prompt disclosure of discoveries is jeopardizing the patent system, Dr. Robert E. Wilson, president of the Pan American Petroleum and Transport Company, New York, asserted in an address following the presentation to him of the 1943 Perkin Medal of the American Section of the Society of Chemical Industry.

Secrecy, an alternative to our present system, would retard the nation's progress in both science and industry, the speaker warned.

"Ill-considered legislation may be adopted," Dr. Wilson declared, "which would hamper all research, prevent the prompt and free exchange of information, destroy the market of the independent inventor, and discourage the continuance of American industrial research, of which we are so justly proud."

Science News Letter, January 23, 1943

ENGINEERING

Emergency Radio Phone

Mobile stations stand ready to bridge gaps and keep 'em talking should war or weather cut vital telephone communications.

By GLENN SONNEDECKER

➤ RADIO STATIONS you never hear are ready for action if blitz by war or weather cuts vital telephone communications.

Over a hundred radio telephone outfits are now stationed throughout the country, ready for any emergency. This is double the number on hand two years ago and radio equipment is being increased further as materials permit.

Most units are mobile, dashing to the scene of disaster. Then an invisible radio beam bridges the wire break to keep messages humming over the great wire web which coordinates the nation's war effort.

Compact radio trailers weighing less than a ton, including all equipment, have been developed. When necessary the radio unit is jerked out, loaded on plane, train or boat, and speeded to the point where war communications have been interrupted.

The radio link in a telephone network involves many engineering problems.

For emergency radio telephone use, scientists were handed the problem of developing terminal arrangements which would be simple, inexpensive and readily portable.

Out of the laboratory came equipment weighing less than 500 pounds and divided into sections that can be handled or operated easily by one man.

Gasoline Generator

A gasoline-driven generator produces the necessary power.

Electricity for a flatiron is all that is needed to operate the complete equipment. A broadcasting frequency of 2,726 kilocycles, considerably above the ordinary broadcast band, has been assigned for this emergency service.

When talking over your telephone during an emergency radio telephone connection, the speech currents are connected through a relay to the transmitter. A part of these speech currents are sidetracked to produce power which automatically turns on the transmitter and also operates another relay hooked to the sending antenna. Then a speech-modulated wave like the one heard on your own radio, shoots off into space.

Across the wire break, another mobile unit has rolled into place to pick up the message. The waves go into an ordinary radio receiver through a relay similar to that at the other station. Here a part of the amplified signal is again utilized to produce current for the second relay which connects with the telephone line.

When your friend on the other end of the wire talks, the stations just operate in reverse.

Why all these relays? It would be impossible to connect the radio transmitter and receiver to the wire lines and then go ahead and talk, Dr. Austin Bailey of the Bell Telephone System explains. Everything that came out of the receiver would go back into the transmitter and be sent as an echo to the other end of the line.

Your voice would not only sound hollow, like yelling in a rain barrel, but if the radio system amplified the signals, echos would build up into an unintelligible howl.

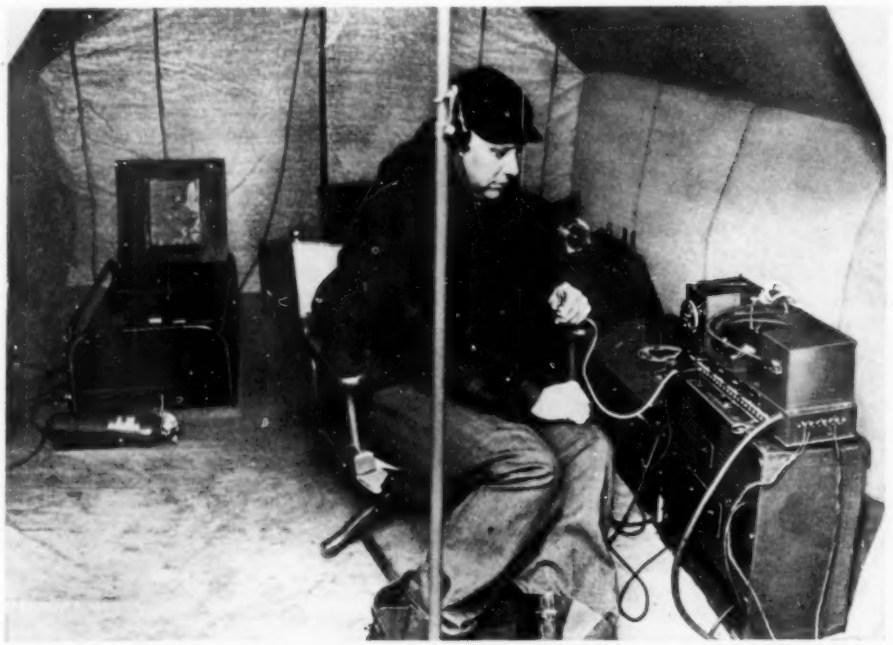
Relays prevent this by making the radio link a "one way at a time" circuit. Thus only one antenna and one radio channel are needed for both stations.

Only one person con talk at a time because the reversal of transmission direction is under the control of speech currents. Your station operates only as long as you keep talking. Then it goes off the air, clearing the channel for the reply.

Engineers of the Bell Telephone laboratories had to develop relays that would activate the transmitter in a flash and release slowly to prevent chopping up sentences between words.

With these technical difficulties solved, more equipment on hand, and the increased experience of recent disasters, radio telephone engineers are now ready to protect vital communications in any emergency.

They have met the test against hurri-



BRIDGING GAP—This radio telephone unit spanned the Hudson River after a vessel severed underwater cables.

TRAILER—This emergency outfit can easily be moved to any point where telephone communication wires are broken, completing vital circuits by radio.

canes, sleet, flood and fire during the past few years.

Anticipating such needs, the units are moved about the country on a seasonal basis.

"For example, during the hurricane season more equipments may be held in readiness along the Atlantic and Gulf Coast areas," Dr. Bailey said, "while during the winter months these same equipments have new locations in the sleet belt."

Today, with the United States at war, mobile radio telephone units stand ready to reach vulnerable points within a few hours. They can restore communications that could not be quickly linked by any other means.

Science News Letter, January 23, 1943

● RADIO

Saturday, January 30, 1:30 p.m., EWT

"Adventures in Science," with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Dr. William J. Morse, of the U. S. Department of Agriculture, will discuss "Soya Beans as a Food Part."

Monday, January 25, 9:15 a.m., EWT; 2:30 p.m., CWT; 9:30 a.m., MWT; and 1:30 p.m., PWT

Science at Work, School of the Air of the Americas over the Columbia Broadcasting System, presented in cooperation with the National Education Association, Science Service and Science Clubs of America.

"Big Fleas Have Little Fleas" will be the subject of the program.

MANPOWER

Laws Need Change

Government research agent charges that war work is hampered by workmen's compensation laws and attitudes toward physically handicapped.

➤ RECRUITMENT of labor for war production plants is being seriously interfered with and available labor is being inefficiently used because of faults in workmen's compensation laws in some states and the attitude of some employers toward the physically handicapped, Terry Foster, research agent for the vocational rehabilitation division of the U. S. Office of Education, charged at the Congress on Industrial Health sponsored by the American Medical Association in Chicago.

Changes in the laws and in employers' attitudes, he declared, will contribute now to the war effort and greatly facilitate the rehabilitation of the war injured. There will be one hundred thousand of the latter for each year of our participation in the war, he stated. In addition to this there is a constant pool, in peace time, of two million who are unemployed because of physical disability.

Employers should realize, he stated, that a disabled worker properly matched with a job is a safer risk than a physically normal worker improperly matched.

He urged changing present compensation laws so that they will really be compensation laws and not merely employers' liability laws. They should not only protect the employer and compensate the disabled worker but encourage and give him an incentive to rehabilitate himself.

Benefits allowed at present under some laws are so small that the worker may have to use all his compensation to pay for medical care for his injury, leaving nothing for rehabilitation for working again. As a result he is thrown on his family or the taxpayers, to be supported for the rest of his life. Second injury clauses, providing that management must be liable for the total results of a second injury which might run to total permanent disability and be prohibitively costly, are an effective barrier to the worker's reemployment in many cases.

Even in states where benefits are more nearly adequate, there is no encouragement to the worker to rehabilitate himself of any penalty for his failure to do so. As a result, Mr. Foster charged, many workers are simply pauperized by the laws.

Science News Letter, January 23, 1943

Social Security Blamed

➤ SOCIAL security and labor organizations which force a vast and increasing army of older workers to idleness and to charity disguised under the name of old age pensions were vigorously denounced by Prof. Anton Carlson, of the University of Chicago at the Congress of Industrial Health.

As a labor union carpenter and farm hand before going to college and entering on a career as medical scientist, Dr. Carlson said he spoke with experience and knowledge of all sides of the question. The labor organization or union philosophy of equal hourly wage for all workers in each special trade must, he said, share part of the blame for the discarding of older workers by management and for the destruction of morale and satisfaction in working of the superior worker who is held to the level of the mediocre worker.

Social security for the aging population, he declared, is all right in principle, but it should take the form of labor for which these people are capable, and not the form of pay for doing nothing. It is a sad reflection on education and no sign of intelligent planning if men and women over 60 have neither the opportunity nor training to do some work of value to themselves and society.

"By keeping in idleness older workers who can still perform useful labor," he charged, "we are not only wasting valuable human resources, but we are contributing to biologic parasitism in and degeneration of human society. Man is no exception to the biologic law that existence without effort and without struggle impairs the species."

Science News Letter, January 23, 1943

A double line of *eggs* reaching from the earth to the moon: that was not the total U. S. egg production in 1942, but merely the increase over previous years.

MEDICINE—PSYCHOLOGY

Mental Aid for Injured

Athletic games and pleasant environment urged as remedy for too long prolonged convalescence from industrial injuries.

➤ ATHLETIC GAMES, exercise and entertainment as a method of treating injured workers who for psychological reasons stay on the sick list long after their injuries are healed was proposed by Dr. Alfred P. Solomon, of the University of Illinois College of Medicine.

Many of these patients are angry and feel they have been "pushed around." They may have developed an undue dependence on or zealous possessiveness of a no longer needed crutch, brace or cane. Their long period of relative inactivity and tension has usually left them weak, flabby, with bad hygienic habits and poor morale. Their philosophy of life was directed toward establishing a prolonged disability, instead of toward growth, health and achievement.

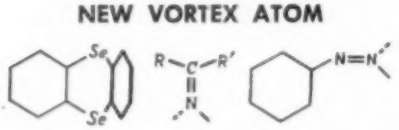
Sometimes such patients can be rehabilitated by psychiatric treatment alone, but Dr. Solomon finds that they cooperate in a treatment which offers them "diversion, recreation and play, good body development and amiable companionship."

He gets best results by sending the patients away from home to an institution like a Y.M.C.A. with a well-equipped gymnasium. The patient is given an athletic companion who is skilled in sports, resourceful, tolerant, sympathetic to the patient's resistive behavior and interested in the results of the treatment. With this companion the patient learns athletic skills, plays games, goes on sight-seeing excursions, long walks in the park and to places of interest and amusement. The emphasis at first is on play and recreation, with muscle training exercises introduced later as the patient gets over his idea that these are tests of his ability to return to work. Psychotherapeutic interviews at the physician's office are also given. The average patient will be rehabilitated with about six weeks of such treatment.

Dr. Solomon recommends that private capital or the government equip a large gymnasium with equipment and psychiatrically trained staff for treatment of patients with psychologically prolonged convalescence from industrial injuries.

Science News Letter, January 23, 1943

ESSAYS ON THE NEW VORTEX ATOM



There are many molecules which are not symmetrical as they should be under the Rutherford-Bohr theory of atomic structure, but which always exist in folded or distorted forms exactly as the vortex theory requires. When theories and facts conflict, then it becomes the duty of scientists to change the theories and not conceal the facts.

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War Injured Helped

➤ SIMILAR TREATMENT for war-injured men was suggested in a report by Dr. John S. Coulter, Chairman of the A.M.A. Council on Physical Therapy. He told of British experience with an air gunner who was disabled and in the hospital for ten months because of a torn and displaced cartilage in the knee. In spite of correct diagnosis, skillful operation, good wound healing without infection, arthritis or other complication, the patient had only half normal movement of the joint, walked slowly and limpingly, was depressed and resentful and ten months after the injury his incapacity was more complete than on the day of his admission to the hospital.

He was transferred to one of the orthopedic rehabilitation centers of the R.A.F. Medical Service where he saw the sky, sea and open spaces instead of the stone walls of hospital wards, corridors and massage rooms. A lounge and writing room, tasteful decorations, flowers, a varied menu, evening concerts and lectures or billiards and other games brought a smile to his face and a sparkle to his eyes within a few days. He learned to walk and run and became a gymnasium enthusiast. Within seven weeks he returned to his unit and full duty, the "nerve in his knee" forgotten.

This is no exceptional case, Dr. Coulter declared. Industrial injury records show hundreds of men who undergo the same experience of protracted disability and deterioration of morale in spite of good treatment for their injured bodies. The remedy for the situation, the secret of success in rehabilitating war or industrially injured is to treat them, from the moment of their entrance into the hospital, as persons who are perfectly well except for "one cracked-up part."

This treatment must start at the bedside with occupational or work treatment as well as physical therapy, massage and the like. In this connection Dr. Coulter criticized the present Army set-up which, he stated, leaves "the physical therapy of the injured soldier in charge of a female physical therapy aide."

"Apparently, however, there is nothing in the set-up for a qualified medical officer to be in charge of rehabilitation," Dr. Coulter stated.

A recent law, he pointed out, gives physical therapy aides in the army the same rank as nurses but omits occupational therapy aides.

Science News Letter, January 23, 1943

NUTRITION

Post-War Feeding Should Be Based on Scientific Advice

➤ GOVERNMENT agencies should get scientific advice as early as possible on their plans for post-war feeding of the starving peoples in war-torn lands, Dr. Morris Fishbein, editor of the *Journal of the American Medical Association,* declared at the A.M.A. sponsored Congress on Industrial Health.

"Indiscriminate distribution of great quantities of food is wasteful," he stated, "and will not so surely solve the needs of the peoples concerned as will a scientific study of the primary deficiencies that exist and the diseases and degeneration that resulted from such deficiencies and the supplying of proper amounts of those foods and special ingredients of foods that have been the most deficient and are therefore the most necessary."

Even with rationing, the food supply in the United States, he declared, is sufficient for each of us to get sufficient amounts of vitamins A and C from our diet if we choose and use foods wisely, without recourse to vitamin pills. He criticized the indiscriminate use of vitamin preparations and pointed out that careless shopping and food preparation and cooking lead to much waste of vitamins in foods.

We fortify our foods with riboflavin (one of the B complex vitamins) for

example, and leave the milk bottle in the sunlight for an hour so that the milk loses most of its riboflavin, he pointed out.

Old people do not eat properly in relation to their lessened output of energy, Dr. Fishbein stated in discussing the special problems of nutrition in infancy and old age. A greater number of men and women over sixty years, he said, might be capable of standing erect, working efficiently and be free of the aches and pains formerly considered a necessary accompaniment of old age if older people ate properly.

Science News Letter, January 23, 1943

METALLURGY

Substitutes Are Better

New alloy steels developed for airplane engines and other war equipment will stretch stores of nickel, chromium and tungsten.

➤ AN ALMOST completely new set of alloy steels will soon be used for most of the working parts of aircraft engines and other war equipment. Selected from the "National Emergency" series of steels, they will stretch the nation's supply of nickel, chromium, tungsten and other strategic alloying elements, M. H. Young and H. Hanink of Wright Aeronautical Corporation, Paterson, N. J., told the meeting of the Society of Automotive Engineers in Detroit.

The new steels will prove in all respects equal, and in some cases superior, to those now used in aircraft engines, Mr. Young maintained.

Other new, widely-used substitute materials are plastics, synthetic rubber and silver. Many of the products are cheaper, better and more versatile than they were originally, the speaker declared.

High temperature and stress conditions may limit the use of plastics in engine construction but other applications are being made.

Silver is a highly satisfactory bearing material, Mr. Young said. The new bearings are no more expensive than those they replace.

Development of various types of synthetic rubbers has led to wider use of these products in engines, as blends may be selected which have a particular resistance to heat, oil and fuel.

Science News Letter, January 23, 1943

Few Premature Bursts

➤ NOT MORE than one high-explosive shell goes off prematurely for every 1,250,000 rounds fired, Col. H. H. Zornig, Ordnance Department, Watertown, Mass., told the meeting of the Society of Automotive Engineers.

This high safety factor depends on design and metallurgical requirements, the speaker pointed out. American shells must be free from defect, uniform and strong.

Low strength alloys may be used in mortar shells, Col. Zornig explained, because of low firing stresses in this type of weapon. But shells used in rifles larger than 40 mm. must be produced from forged billets and carefully inspected for soundness.

Science News Letter, January 23, 1943

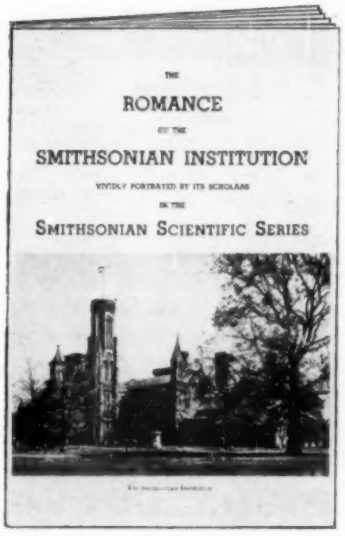
New Bearing Alloys

➤ LACK OF TIN alloys need cause no worry that our motorized Army will be handicapped by bearing failures. New bearing alloys with a lead base containing arsenic and silver showed little corrosion when tested with various lubricating oils at high temperatures. L. M. Tichvinsky, senior mechanical engineer of the U. S. Naval Engineering Experiment Station at Annapolis, reported these results to the meeting of the Society of Automotive Engineers.

Further research to develop tin-substitute bearing materials should thus be practical, the speaker pointed out. Bearing alloys of high corrosion resistance are especially important during war because engines must perform overtime at high speed and increased pressure, under adverse conditions.

Science News Letter, January 23, 1943

The cannon-carrying *tank destroyer*, brand-new vehicle of World War II, owes most of its mobility and speed to an endless-band type of track in which steel cables and cross-pieces are imbedded in rubber to form a one-piece belt.



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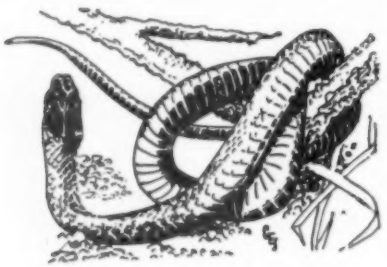
ZOOLOGY-BOTANY

NATURE RAMBLINGS

by Frank Thone



Figments of Fancy

➤ DON'T WORRY too much about that friend or kinsman who may be in the snake-infested jungles of the tropics, where the creeping vines are almost as deadly as the serpents that hide in them, craftily waiting for their victims to pass. They're all myths, concocted by travelers who want to make some innocent newspaper reporter's eyes bulge out, declares Prof. E. D. Merrill, Harvard University botanist.

Prof. Merrill ought to know, for he spent 22 years in the Philippines, with a number of excursions into Malaya, Java and Borneo, and has had some experience in the American tropics besides, on half a dozen trips to Cuba.

"On many trips lasting from two to six weeks each," states Prof. Merrill (*Science*, Jan. 8), "on some of them being constantly in the forests and jungles, and seeing no other persons than the members of my own party, I have never actually seen a single snake, poisonous or otherwise; on other trips one might average seeing perhaps one snake in a week. The snakes are there, but if one is interested in snakes one must know where, how, and when to look for them. They are mostly timid and disappear at the slightest disturbance."

Friends who have had experience in both Old and New World tropics confirmed Prof. Merrill's opinions when he queried them. Among them was Col. Arthur S. Fisher, who saw active service on Bataan and was evacuated from Corregidor just before its fall. He saw exactly four snakes in three months, and two of these were brought to him by soldiers.

As for the deadliness of jungle plants, Prof. Merrill declares that he has never run into any that could cause as much trouble as our common poison ivy. There are some members of the nettle family that can sting pretty badly; but "they are not dangerous, and not even a cub Boy Scout, once stung, would touch a plant a second time."

Curiously enough, some tropical plants that may cause skin rash by contact with sap or leaves bear fruits that are highly prized by natives and white men alike. Most familiar of these, perhaps, are the mango and the cashew nut.

All in all, therefore, the most poisonous things likely to be encountered in tropical trees are the Japs — and our soldiers and marines know how to use the proper antidotes for them.

Science News Letter, January 23, 1943

MEDICINE

Health Pick-Me-Ups For Tired Business Man

➤ NINE HEALTH mandates for tired and rundown business and industrial executives were given by Dr. Walter Alvarez of the Mayo Clinic at the Congress on Industrial Health.

The scarcity of good brains in the community is bad enough, Dr. Alvarez said, but worse is the fact that even these good brains are unable to stand for long the strain of constant and heavy use. They need more rest and peace than they get in modern industry.

The nine health mandates for executives are: 1. Slow down; 2. Take a month's vacation or at least shorter rest periods; 3. Delegate authority to others; 4. If you cannot sleep, a soporific will be helpful; 5. Do not smoke too much; 6. If you do play, do not play too intensely; 7. Do not get angry; 8. If you are gaining weight, avoid fats and sugars; 9. If your heart muscle is not so good, walk and live at a slower pace.

A man can tell when his nervous system is beginning to break down, Dr. Alvarez said, by such common symptoms as a sense of impaired health and energy, getting up tired in the morning, petering out by noon, feeling a need for forcing the brain, having difficulty reading through a long report or remembering what was read, impatience, ill humor, increasing irritability and "a desire to snap peoples' heads off."

Science News Letter, January 23, 1943

VOLCANOLOGY

Smoke Above the Clouds Landmarks Airmen's Flights

See Front Cover

➤ THEY THAT GO DOWN to the sea in ships, wrote the Psalmist, see the works of the Lord, and his wonders in the deep. They that go up into the ocean of air in the newer ships of today see works and wonders no less strange and marvelous. Aviators on patrol along the long Aleutian peninsula and island chain landmark their flights by volcanic peaks that are often smoke-beacons, sending forth their perpetual plumes of light ash from hearths far below the snow that lies on their flanks and the clouds that float about them. The cover picture, typical of the Aleutian scene, is from a photograph taken by a U. S. Navy pilot.

Science News Letter, January 23, 1943

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• New Machines and Gadgets •

⚙ *WOOD CELLULOSE fiber pipes are now being used, not only for electrical conduits, but for inside drain pipes, as a protective jacket around metal pipes exposed to corrosive substances, and experimentally as soil pipes and oil well casings. The wood fibers are formed into rugged tubes by a heat process, then impregnated. The resultant pipe is chemically inert, light weight, with high mechanical strength and water resistance.*

Science News Letter, January 23, 1943

⚙ *A SPATTERPROOF LAMP for welding and rough industrial service, made of special glass which resists penetration of hot metal particles, is said to give longer service than the usual lamp of this type.*

Science News Letter, January 23, 1943

⚙ *A SMALL TENSILE tester recently developed will test any material up to 10,000 pounds, although the instrument is only 32 inches tall. It will determine elastic limit, stress, strain, stiffness, resilience and other factors. The device is the smallest of its kind having such wide usage and adaptability, the manufacturer asserts.*

Science News Letter, January 23, 1943

⚙ *AN AIR-TIGHT pocket tobacco container has been patented which has a compartment for both storing and loading a pipe. The device discharges tobacco into the bowl of the pipe and tamps it properly ready for smoking.*

Science News Letter, January 23, 1943

⚙ *IMPROVED WATER-COOLED, rapidly adjustable clamps have been developed to hold the arc electrodes in spectrographic analysis. For inspection of war materials and other important uses, this method is replacing older chemical tests. Work is speeded by the new clamps and the improvement is expected to be adopted by industry. Controls are operated from outside a grounded safety housing which protects the operator against harmful radiations, fumes and shock. This is important, since potentials as high as 40,000 volts may be needed to obtain satisfactory spectra from volatilized metallic vapors.*

Science News Letter, January 23, 1943

⚙ *PORTABLE water carriers, such as the one shown in the picture, are being extensively used on war construction jobs. It provides fresh, cool water in clean paper cups to the workers. Loss of manpower hours is said to be materially reduced*

Science News Letter, January 23, 1943

⚙ *A NEW RESIN waterproof glue, similar to that used to make plywood aircraft, is now to be used in the shoe industry. The powdered glue requires only the addition of water. No heat or solvent is necessary as with glues and cements now being used, the manufacturer states.*

Science News Letter, January 23, 1943

If you want more information on the new things described here, send a three-cent stamp to Science News Letter, 1719 N St., N. W., Washington, D. C., and ask for Gadget Bulletin 140.

MEDICINE

Part Played by Injury In Cancer Is Explained

➤ A GREAT MANY people have long had the idea that an injury such as you might get from being hit by a heavy object or from falling and striking hard against a heavy object, can cause cancer. This is a mistaken idea.

"It is now universally conceded by pathologists that a single mechanical trauma (injury) never produces cancer in previously normal tissues," Dr. James Ewing, one of the nation's great cancer experts, and former director of Memorial Hospital, in New York, declared at the officers training school for the Women's Field Army of the American Society for the Control of Cancer.

"The causes of cancer," he explained, "are chiefly found in the intrinsic qualities of tissue cells. However, when trauma (injury) is associated with delayed wound healing, or infection, or is repeated, or carries into the tissues irritating chemicals or other foreign bodies, cancer sometimes follows which would not have occurred without the trauma. Injury thus becomes an indirect exciting cause of some malignant tumors."

Surprisingly few tumors have been proved beyond reasonable doubt to be the result of injury, he continued. Only 37 cancers possibly due to injury were found among 26,389 injured persons in one year's experience at the Workmen's Compensation Bureau in New York State. French authorities estimate about five or six tumors occur among each 100,000 injured persons. Another authority quoted by Dr. Ewing states that in the German hospitals among 3,710,370 war wounds only 3.7% of malignant tumors were observed. These rates are very close to the rate of cancer occurrence that would normally be expected among people in the same age groups as those in the surveys.

Science News Letter, January 23, 1943

A female *toad* of the American (Bufo americanus) species was found containing more than 15,000 eggs.

Giant steel "sky chambers" now make it possible to study the effects on men and materials of *altitudes* as high as eight miles.

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First Glances at New Books

➤ THE OCEANS certainly is a sufficiently ambitious title for any book, but if it is justified anywhere it surely is in the present volume, for the senior author, Dr. H. U. Sverdrup, is director of the Scripps Institution of Oceanography, and his two associates, Dr. Martin W. Johnson and Dr. Richard H. Fleming, are also on the staff at La Jolla. There is no shirking of the big task undertaken, though it takes well over a thousand pages to tell the story of The Oceans in its chemical, physical and biological phases. Decidedly not a book for amateurs, it is a "must" for scientific libraries in many disciplines. (*Prentice-Hall*, $10).

Science News Letter, January 23, 1943

➤ IF RACE, REASON AND RUBBISH hasn't been burned by the Nazis yet, it's only because Hitler's not-so-bright young men haven't got hold of a copy. Its Swedish author, Gunnar Dahlberg (a Nordic of the Nordics) interlards a popular but authoritative presentation of the basic facts of genetics with scornful refutations of the claims of racist "experts" that leave the Master-Race myth without a leg to stand on. Lancelot Hogben has done a good job of translation. (*Columbia Univ. Press*, $2.25).

Science News Letter, January 23, 1943

➤ SPEAKING OF MAN is a favorite occupation of our highly self-conscious species. Such discussions are apt to become mere "bull sessions," for most of us do not have adequate factual background on which to construct a philosophy. Not so with the book which Dr. Michael F. Guyer, veteran University of Wisconsin zoologist, puts forth under the above title (*Harper's* $3.50). A zoologist's eyes are good windows from which to look forth on *Homo sapiens* and his doings: herein the results of a lifetime of such looking are set forth with cogency, yet with a spice of humor.

Science News Letter, January 23, 1943

➤ BATRACHIANS fascinate everybody, even those who merely find them mildly comic and do not realize what valuable members of the community they are. The new HANDBOOK OF FROGS AND TOADS, by Anna Allen Wright and Albert Hazen Wright (*Comstock*, $3), will therefore undoubtedly enjoy the success to which its good descriptions and even better illustrations entitle it.

Science News Letter, January 23, 1943

➤ WHAT HAPPENED at Midway? in the Coral Sea? Why Pearl Harbor? Singapore? Bernard Brodie tells, in simple and understandable common English, illustrated with equally simple and understandable sketches, in A LAYMAN'S GUIDE TO NAVAL STRATEGY (*Princeton Univ. Press*, $2.50). Comes close to being "must" reading nowadays.

Science News Letter, January 23, 1943

➤ WEATHER INTERESTS people now more than ever, since the human race has become a winged species in both war and peace. Very timely, therefore, is the appearance of a highly readable yet scholarly book (well illustrated, too), WAYS OF THE WEATHER, by a veteran scientist of the U. S. Weather Bureau, Prof. W. J. Humphreys (*Jaques Cattell Press*, $4). If you are one who reads only one book about a given subject, this is your book; if you are sufficiently interested to have several, this is the first one you should get.

Science News Letter, January 23, 1943

• Just Off the Press •

THE ADVANCEMENT OF SCIENCE: The Report of the British Association for the Advancement of Science, European Agriculture, Vol. 11 No. 6—British Association for the Advancement of Science, *Burlington House*, London, 63 p., 5 shillings.

A BOY AND A BATTERY—Raymond F. Yates—*Harper & Bros.*, 120 p., illus., $1.50. Electric experiments described in this book may be carried out with equipment found in the home.

CHEMISTRY IN WARFARE: Its Strategic Importance—F. A. Hessel, M. S. Hessel and J. W. Martin—*Hastings House*, 179 p., illus., $2. New revised and enlarged edition with technical appendix.

COMMON EDIBLE MUSHROOMS—Clyde M. Christensen—*Univ. of Minnesota Press*, 124 p., illus., $2.50.

CULTURE ELEMENT DISTRIBUTIONS: XXII PLATEAU—Verne E. Ray—*Univ. of California Press*, 262 p., $1.75. (Anthropological Records Vol. 8, No. 2).

DIFFERENTIATION AND GROWTH OF GASTRULAR ANLAGEN IMPLANTED HOMOPLASTICALLY INTO TADPOLES OF HYLA REGILLA—Morgan Harris—*Univ. of California Press*, 44 p., illus., 7 plates, 75c. (University of California Publications in Zoology, Vol. 51, No. 2).

ESSENTIAL MATHEMATCIS FOR SKILLED WORKERS—Harry M. Keal and Clarence J. Leonard—*Wiley*, 293 p., illus., $1.50. "Review arithmetic, algebra, geometry, trigonometry, slide rule, and applied technical problems."

FACT AND FANCY IN THE T.N.E.C. MONOGRAPHS—John Scoville and Noel Sargent, compilers; sponsored by the National Association of Manufacturers—*H. W. Wilson*, 812 p., $3. "Reviews of the 43 monographs issued by the Temporary National Economic Committee."

LATIN AMERICA: Countrysides and United Regions—Robert S. Platt—*McGraw-Hill*, 564 p., illus., $5. A new geography.

MANUAL OF EXPLOSIVES, MILITARY PYROTECHNICS AND CHEMICAL WARFARE AGENTS: Composition, Properties, Uses—Jules Bebie—*Macmillan*, 171 p., illus., $2.50.

MATHEMATICS OF AIR AND MARINE NAVIGATION—A. D. Bradley—*American Book Co.*, 103 p., and tables, $1. Mathematics of immediate practical value to the man who is trying to find his way around this globe.

THE MECHANISM OF AMPHIBIAN GASTRULATION: 1. Gastrulation—Promoting Interactions Between Various Regions of an Anuran Egg (Hyla Regilla)—A. Mandel Schechtman—*Univ. of California Press*, 39 p., illus., 50c. (University of California Publications in Zoology, Vol. 51, No. 1).

MODERN CAMOUFLAGE: The New Science of Protective Concealment—Robert P. Breckenridge—*Farrar & Rinehart*, 280 p., illus., $3.50.

THE NATURE OF THE RED, YELLOW, AND ORANGE PIGMENTS IN WOODPECKERS OF THE GENUS COLAPTES—Frederick H. Test—*Univ. of California Press*, 18 p., illus., 25c. (University of California Publications in Zoology, Vol. 46, No. 6).

ON THE PRESERVATION OF INSECTS, WITH PARTICULAR REFERENCE TO COLEOPTERA—J. Manson Valentine—*Smithsonian Institution*, 16 p., 15c.

POSTMORTEM ON MALAYA — Virginia Thompson—*Macmillan*, 323 p., $3. Issued under the auspices of the Secretariat, Institute of Pacific Relations: International Research Series.

PRINCIPLES OF ELECTRONICS—Royce Gerald Kloeffler—*Wiley*, 175 p., illus., $2.50.

PROBLEMS IN BLUEPRINT READING—Drew W. Castle—*Manual Arts Press*, 93 p., illus., 96c. Revised and enlarged edition.

THE THEORY OF THE PHOTOGRAPHIC PROCESS—C. E. Kenneth Mees—*Macmillan*, 1124 p., illus., $12. Excellent technical reference book by an expert.

UNITED STATES AT WAR: December 7, 1941 — December 7, 1942 — *Army and Navy Journal*, 180 p., $3. Report of Government, Army and Navy, Industry and Labor activities during the first year of the war.

WARTIME REFRESHER IN FUNDAMENTAL MATHEMATICS—W. C. Eddy—*Prentice-Hall*, 248 p., illus., $1.40, text edition, $1.05.